

A STUDY OF THE GENUS *CENTURIO*.

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A recent study of the Bats in the collection of the Academy revealed the fact that three alcoholic specimens of the curious genus *Centurio* were preserved therein. As comparatively little material of the genus had ever been examined, I secured, through Mr. Gerrit S. Miller, Jr., a loan of the three representatives contained in the collection of the United States National Museum. The acquisition of these specimens considerably enlarged the series for examination so that it numbered five alcoholic specimens, one skin and one odd skull.

With this series, probably the largest ever gathered together, I have made some notes and observations, the results of which have induced me to publish a summary of our knowledge of the genus.

Record of Specimens.—The first specimen of *Centurio* known to naturalists was collected on the cruise of H. M. S. "Sulphur," and was examined by Dr. Gray, of the British Museum, who described the genus and applied the specific name *senex* to the specimen.¹ The locality was stated to be Amboyna, but later² Gray seemed doubtful of this, as he says: "Captain Sir Edward Belcher informed me this bat was found in Amboyna, but Mr. Hinds (surgeon of the expedition) does not appear to be so confident on the subject, and rather suspects it came from South America. It was taken from a bottle containing animals from both countries."

In 1854 Lichtenstein and Peters described a specimen supposed to be from Cuba as *C. flavogularis*,³ but later Alston⁴ informs us Dr. Peters had written him that the locality was erroneous.

Saussure was the next author to inform us further regarding this genus, a specimen from "les régions chaudes du Mexique" being described by him as *C. mexicanus*.⁵

The acquisition by the Smithsonian Institution of a specimen

¹ *Ann. and Mag. Nat. Hist.*, X, p. 259. 1842.

² *Voyage of the "Sulphur," Mamm.*, p. 26. 1844.

³ *Monatsb. K. Preuss. Akad. Wissensch.*, Berlin, p. 335. 1854.

⁴ *Biol. Cent. Amer., Mamm.*, p. 51. 1879.

⁵ *Rev. et Mag. de Zool., 2e ser.*, XII, p. 381. 1861.

from Mirador, Mexico, with the throat folds greatly developed caused Dr. Harrison Allen to describe the subgenus *Trichocoryes* and the species *memurtrii*, which he placed therein.⁶ A specimen of *C. mexicanus* from the same locality accompanied the one described. Alston mentions⁷ that Dr. Peters had informed him that the Berlin Museum possessed a specimen of *C. memurtrii* as well as one of *C. senex*.

The only remaining published record of specimens of this genus is that of one female from Cerro de los Pajeros, Las Vegas, Vera Cruz, Mexico, which was described by Mr. Henry L. Ward as a new species, *Centurio minor*.⁸

General Relations.—A very superficial examination of a specimen of *Centurio* reveals the gap which exists between it and the other genera of the subfamily in which it has previously been placed. Of the genera of the *Stenodermatine* I have examined all but two, i. e., *Ametrida* and *Ectophylla*, and the resulting belief is that *Centurio* should stand apart. The singular facial structure, throat folds, absence of true nose-leaf, and peculiar canines all present an individuality not shared by the other genera.

Accordingly I propose to separate *Centurio* as a new subfamily, the differential characters of which would be as follows:

STENODERMATINÆ.	CENTURIONINÆ.
Rostral portion of skull not very broad (except in <i>Spharonycteris</i> and probably <i>Ametrida</i>).	Rostral portion of skull very broad.
Upper canines without anterior basal concavity.	Upper canines with anterior basal concavity.
Face with distinct nose-leaf, and without distinct cutaneous facial ornaments (except in <i>Spharonycteris</i>).	Face without distinct nose-leaf, and with distinct cutaneous facial ornaments (nostrils not opening directly upon the surface).
Upper lip not emarginate.	Upper lip centrally emarginate.
Ears without additional lobe on the internal margin.	Ears with additional lobe on the internal margin.
Throat without transverse folds of skin.	Throat with transverse folds of skin.

⁶ *Proc. Acad. Nat. Sci. Phila.*, pp. 359-361. 1861.

⁷ *Biol. Cent. Amer., Mamm.*, p. 52. 1879.

⁸ *Amer. Natur.*, XXV., p. 750. August, 1891.

The *Centurionine* have no close affinity with the other divisions of the *Phyllostomatidae*, for while some of the above characters are shared by the *Mormoopine*, the absence of enlarged cutaneous plates on the lower lip immediately shows the distinctness of the subfamilies. The genetic relations are undoubtedly with the *Stenodermatine*, but to which portion of it seems doubtful, though *Sphaeronycteris* is possibly the closest related of any.

CENTURIO Gray.

1842. *Centurio* Gray, Ann. and Mag. Nat. Hist., X, p. 259. Type, *Centurio senex* Gray.

1861. *Trichocoryes* H. Allen, Proc. Acad. Nat. Sci. Phila., p. 359. Type, *Centurio mcMurtrii* H. Allen (= *Centurio senex* Gray).

Generic Characters.—The same as those of the subfamily of which it is the only genus. Dentition i. $\frac{2-2}{2-2}$ c. $\frac{1-1}{1-1}$ p. $\frac{2-2}{2-2}$ m. $\frac{2-2}{2-2}$.

The characters used by most of the describers of these species were color and the form of the upper incisors.

The color differences are slight and can readily be accounted for by the difference of time of immersion in alcohol. The upper incisors also appear to be both two and three lobate, beside bluntly conic.

Centurio senex Gray.

1842. *Centurio senex* Gray, Ann. and Mag. Nat. Hist., X, pp. 259-260 ("Amboyna," very probably some point on the west coast of Mexico or Central America).

1844. *Centurio senex* Gray, Voyage of the Sulphur, Mammalia, pp. 26, 27, Pl. VIII.

1878. *Centurio senex* Dobson, Catal. Chirop. Brit. Mus., pp. 543-545, Pl. XXX, fig. 6.

1879. *Centurio senex* Alston, Biol. Cent. Amer., Mammalia, p. 51.

1854. *Centurio flavogularis* Lichtenstein and Peters, Monatsber. K. Preuss. Akad. Wissensch., Berlin, p. 335 ("Cuba").

1855. *Centurio flavogularis* Lichtenstein and Peters, Abhandb. K. Akad. Wissensch., Berlin (1854), pp. 87-89, taf. I.

1860. *Centurio mexicanus* Saussure, Revue et Mag. d. Zool., 2e ser., XII, pp. 381-383 (warm region of Mexico).

1861. *Centurio mcMurtrii* H. Allen, Proc. Acad. Nat. Sci. Phila., pp. 360-361 (Mirador, Vera Cruz, Mexico).

1879. *Centurio mcMurtrii* Alston, Biol. Cent. Amer., Mammalia, p. 51, Pl. III, fig. 8.

1891. *Centurio minor* Ward, American Naturalist, XXV, pp. 750-753, fig. (Cerro de los Pajeros, Las Vegas, Vera Cruz, Mexico).

Type Locality.—Erroneously given as "Amboyna" (East Indies). As Gray afterward believed, it in all probability came from America, and a comparison of the route of the "Sulphur" (on the voyage of which the specimen was collected) with the

present distribution of the species shows that the specimen was evidently collected on the west coast of Mexico or Central America, at some one of the points visited between San Blas and Panama.

Distribution.—The only accurate records for the occurrence of this species give us little information as to its exact distribution. Aside from Mirador and Cerro de los Pajeros, Vera Cruz, Mexico, the only other accurate captures are from Guatemala⁹ and Cartago, Costa Rica; U. S. Nat. Mus., No. $\frac{1}{3}\frac{2}{3}\frac{1}{4}\frac{1}{5}$.

It has been recorded from "les régions chaudes du Mexique" by Saussure, and erroneously from Cuba by Lichtenstein and Peters. The whole data shows the species to range from south-central Mexico (Cerro de los Pajeros) to Costa Rica (Cartago), probably within zonal limits, but as to this we know little, for while both of the localities in the State of Vera Cruz are well elevated (above 6,000 feet), Cartago lies in a valley between moderately high ranges of mountains, and Saussure's specimen was stated to have come from the warm section of Mexico.

General Characters.—Those of the genus and subfamily of which it is the only representative.

Head.—Short, broad and deep; the upper lip emarginate, the lower jaw extending beyond the upper, both with the margin beaded. Face with a median depression between the eyes, this being flanked by a fold of skin with a sinuate border, superior to this lies a semicircular thickening, above which, between the ears, is a large appressed fan-like structure with a crenulate border; above each eye lies an irregular protuberance, between the eyes extends a narrow sinus which forms the lower margin of the folds mentioned above; between the nostrils lies a flat oblong plate, the upper border of which is rounded in some specimens and produced in others, the nostrils being laterally bordered by raised converging ridges which terminate below in lobes on the upper lip on each side of the central emargination, the latter having a small central lobule. The chin folds in the male are highly developed, numbering three, the anterior one extending from one corner of the mouth to the other, and the posterior one from antitragus to antitragus, the whole being more or less thickly and heavily haired;

⁹ Peters, see Alston, *Biol. Cent. Amer., Mamm.*, p. 52.

the anterior fold bears a central thickening which is enlarged and extends back toward the second fold which bears a central glandular structure, the third fold having a fold of skin of very considerable lateral extent, the whole when pulled forward covering the lower part of the face as a mask; the female presenting rudimentary folds on much the same pattern. Ears not exceeding the muzzle and bearing a large, rather elongate, apically rounded lobe on the internal margin; tragus moderately long, the external margin bearing several lobules, those near the apex usually little developed.

Limbs.—Forearm of moderate length, the thumb compressed, the third finger moderately long. Tibia and foot rather weak. Calcaneum short.

Membranes and Fur.—Membranes moderately tough; the interspace between the fourth and fifth digits and the digital area of the mesopatagium transversely gathered, the tension bars being corded. Uropatagium reaching beyond the middle of the femora, the margin haired. The fur extends upon the wing membrane to a line drawn between the elbow and knee.

Color.—General color above between drab and broccoli brown (Ridgway's *Nomenclature*, Pl. III), tending toward isabelline in some alcoholic specimens and mummy brown (Pl. III) in others; below isabelline. Membrane rather pale mars brown (Pl. III), the interspace between the second and third digits, the gathered portions of the mesopatagium and of the interspace between the fourth and fifth digits semi-transparent.

Skull.—The skull is short and deep, with the rostral portion very broad and steeply descending. Zygoma flaring. Palate short, twice as broad as long, the cleft being acute-angulate anteriorly. Auditory bullæ flattened and not very conspicuous. The figure given by Peters (*l.c.*) is excellent and will show many points hard to bring out in a description.

Teeth.—Upper incisors small, the central pair largest though little exceeding the others in vertical extent; apex bluntly conic, bifid or trifid; upper canines robust, with an anterior basal concavity; upper premolars very unequal in size, the first half the size of the second which bears several lobules on the posterior margin; upper molars twice as broad as long, the crowns rather flat with three principal cusps, the anterior one larger, the external

margin of each bearing one prominent anterior lobe and several posterior to this, the last one of which is considerably developed in the first molar. Lower incisors small, uniform, bifid; lower canines hastate, with an external basal shoulder; lower premolars unequal, the first a simple cone, the second larger, with a posterior shoulder; lower molars low, the anterior somewhat larger than the posterior, the latter ranging from subquadrate to subtriangulate in section, each bearing two low angulate cusps.

Remarks.—It is evident that the species presents some diversity in size and probably some in color, but it is quite as evident that such variation is individual or sexual (the males being on an average slightly larger than the female), and cannot be separated into geographic forms. The single specimen from Costa Rica cannot be separated from specimens from Vera Cruz, Mexico, and the five specimens (three males, two females) from Mirador present considerable variation among themselves.

The species described by Lichtenstein and Peters (*C. flavogularis*) and Saussure (*C. mexicanus*) can readily be placed as synonyms of *C. senex*, Peters afterward admitting such to be the case with *C. flavogularis*; and Saussure's *C. mexicanus* can be matched with specimens of *senex*, the difference in color being very likely due to the length of immersion in the preserving fluid. The species *C. memurtrii* H. Allen was based on the adult male,¹⁰ the folds being in all probability secondary sexual characters.

A close examination of the description of *C. minor* Ward shows that the describer was probably misled by Dobson's description of the chin folds, and in the absence of material for comparison he described a female which agrees exactly with two females before me; the discrepancies in measurement being simply individual, while the second lower premolar of all the available specimens is more than half the size of the first and some are decidedly not triangular in section. The describer of *C. minor* stated that he would not be surprised "if *minor* should eventually prove to be but a variety of *senex*."

Specimens Examined.—Seven: one skin, five alcoholics and one odd skull.

U. S. N. M., $\frac{8289}{37305}$, alc., Mirador, V. C., Mex. ♂. Coll. Dr. C. Sartorius. Type of *Centurio memurtrii* H. Allen.

¹⁰ A fact quite evident on the examination of four males, one of which is the type of the species.

U. S. N. M., $\frac{1}{3}\frac{11}{17}\frac{7}{8}\frac{2}{8}$, alc., Mirador, V. C., Mex. ♂. Coll. Dr. C. Sartorius.

A. N. S., 1,788, alc., Mirador, V. C., Mex. ♂. Coll. Dr. C. Sartorius.

A. N. S., 1,787, alc., Mirador, V. C., Mex. ♀. Coll. Dr. C. Sartorius.

A. N. S., 5,500, alc., Mirador, V. C., Mex. ♀. Coll. Dr. C. Sartorius.

A. N. S., 5,063, skull. Pres. Dr. Harrison Allen.

U. S. N. M., $\frac{1}{3}\frac{2}{7}\frac{3}{11}\frac{2}{11}$, skin, Cartago, Costa Rica. ♂. December, 1877. Coll. C. Cervantez. Pres. J. C. Zeledon.

Comparative Measurements (in millimeters).

	L. Head and Body.	L. Head.	L. Ear. ⁿ	L. Tragus.	L. Fore-arm.	L. Thumb.	L. Third Finger.	L. Tibia.	L. Calcaneum.	L. Foot.	Total Length Skull.	Great Zyg. Width.	Intero. Width.	Height at Base 2 Prem.	Height Br. Case.	Width Palatal Constriction.	L. Palate & Foramen.	Width Palate with Teeth.
Dobson's measurements of <i>C. senec.</i>	76.2	25.4	16.5	7.6	53.3	12.7	93.9	16.5	6.3	10.6								
Lichtenstein's and Peters' measurements of <i>C. flavogularis</i>	75	20	15		42	13.5	86	19	5	13								
Saussure's measurements of <i>C. mexicana</i>	65				45				6									
Ward's measurements of <i>C. minor</i>	65	20	13	4	40	13	84	17	5.5	14								
No. ³⁷¹⁷ / ₅ , U. S. N. M., Mirador, Mexico.	54	22	12	4	41	12	74	19.5	4.7	10	16.2	14.7	5	5.75	11.5	3.5	3	10.5
No. ³⁷³⁰ / ₅ , U. S. N. M., Mirador, Mexico.	52	22	11	4	40	11	78.2	20	4	10.5	17	14.7	5	5.5	11.5	3.3	3	10.5
Type of <i>C. macrurii</i> No. 1,788, A. N. S., Mirador, Mexico....	55.5	20	12	4.1	42.5	11.2	80	20.5	5.2	11								
No. 1,787, A. N. S., Mirador, Mexico....	50.5	20	13	4	43.5	13.5	86	19	6.5	10.25								
No. 5,500, A. N. S., Mirador, Mexico....	52	20	13	3.5	41.2	10	83	17	5.75	10								
No. ¹²⁹² / ₅ , U. S. N. M., Cartago, Costa Rica (dried skin)...	60	circa 20	12		42	12			5	10.75	17	15	5	5.2	12	3.5	3.5	10.2

¹¹ All of the ear measurements taken by myself are from the external notch.